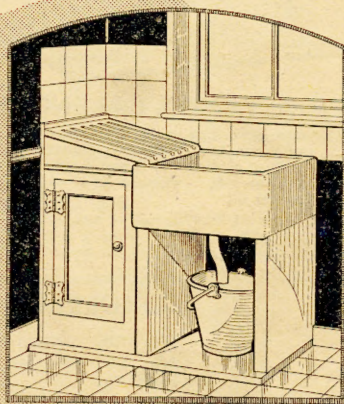
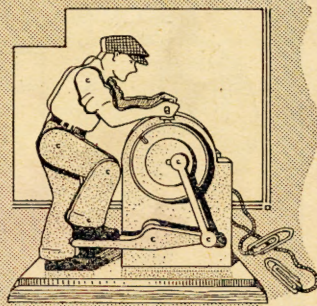


Hobbies

WEEKLY



THINGS TO MAKE AND DO!



April 30th. 1938

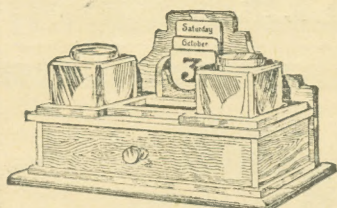
Vol. 86. No. 2219

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THE FRETWORKER'S AND HOME CRAFTSMAN'S JOURNAL

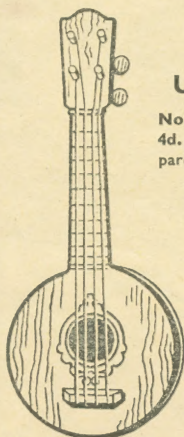
Why not make Your presents

Toys for the kiddies.....a trouser press, or a piece of furniture. These, and lots more besides, can be made from Hobbies designs and materials. Any fellow handy with tools can save money by making his gifts for Birthdays or Weddings. And they will doubly be appreciated by the recipient!



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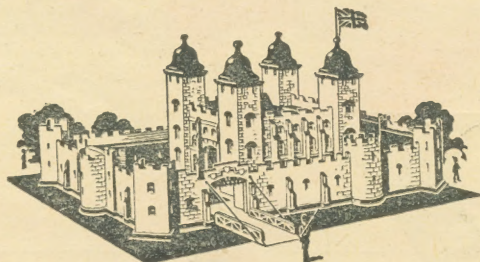
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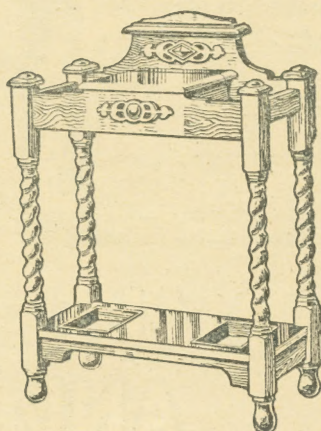


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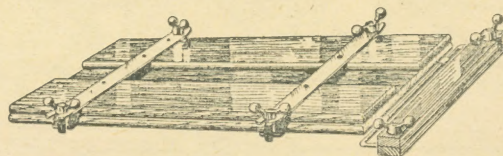
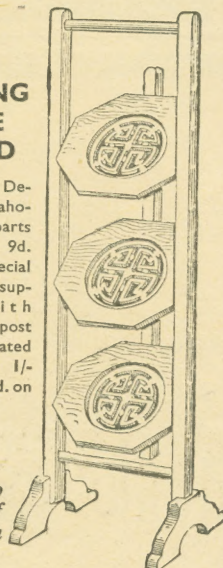
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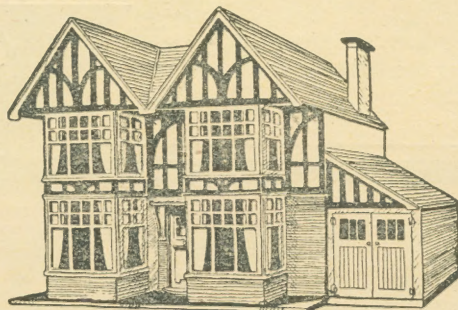


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You save at least half a guinea by making this trouser press. A parcel of planed hardwood with beautifully finished metal fittings, including parts for the stretcher, rubber feet and screws costs only 12/6, carriage forward.

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No. 186 Special. Design 1/-. Plywood, satin walnut, whitewood and all moulding 13/6, carriage forward. Glass for windows, wallpapers, knobs, hinges, and screws 5/6. Post 9d.





Hobbies

WEEKLY



April 30th. 1938

Vol. 86. No. 2219

SCOUT SCARF USES BOARD

ALTHOUGH the design sheet with this week's issue is primarily intended for Scouts, it should be of sufficient interest to almost anyone to be worth while making up. The uniform of the Scout includes a neckerchief worn loosely as a scarf.

One must not look on it, however, as merely part of the uniform because it serves many useful purposes on varied occasions. It is to show you some of these uses that the special board illustrated here can be made up.

On it are shown a dozen ways in which the Scout scarf can be put to other practical purposes, and no doubt some of our Scout readers will be able to suggest even more.

Anyhow, the usefulness of the scarf is well illustrated by this board, and the whole thing is a practical piece of work which should be made by Scouts themselves to hang in their Headquarters.

Wood Supplied

It can be made quite simply from any fretwood, and the use of only a few fretwork tools are required in its completion. A special parcel of boards planed to the correct thickness and size required for each part is provided, and this saves a lot of time getting them out for yourself. They are ready for the design parts of the paper pattern to be pasted upon them, and this is the first job to undertake.

Notice, however, that the actual pictures themselves should be cut out and laid aside as these are not put on the actual board yet. The rest of the pattern is pasted down, then the work of cutting can be undertaken.

The large back-board is a plain piece cut to outline only,

and the dotted lines printed on the pattern itself merely show the positions in which various overlays are to be fitted. These will be cleaned away when you glasspaper the part to take off the paper remains, so it is a good plan to make a little pin hole through them at certain points to show where the overlays are to be fitted on later.

From the bottom edge of this back, mark off a line $\frac{1}{4}$ in. upwards and running right across the wood. This indicates the position of the shelf or lower rail.

Rail and Shelf

This rail is 17 ins. long and when this length is marked out, paste down the two-end portions shown on the sheet. This should then make the distance between the projecting parts exactly the same as the width of the board itself.

Try this out before cutting, to see that the shelf fits round the edge as can be seen in the detail herewith at Fig. 1. The front edge of this board should be rounded with glasspaper to a shapely curve, the whole of its length. The overlays are cut from $\frac{1}{4}$ in. wood and two can be got out together. This is done easily by nailing two $\frac{1}{4}$ in. boards, pasting the design on the upper one, then cutting out in the usual way.

Notice the number of very thin lines in the Scout figure, and be careful to keep these exactly as they are printed. Use a fine drill point and make the hole through the widest part of the line so its position cannot be seen.

Keep your saw-blade very tight in the frame, and hold the wood down to the table close to the blade so it does not jump up. The blade cuts down to one end of the narrow tapered portion, and



is then backed up again to the drill hole.

From there it goes down the other side of the narrow line until it meets the first cut at the end.

The cutting of these thin lines must be undertaken carefully, and if you are not absolutely certain of being able to control the fretsaw properly, then it is better to mark them out in pencil and cut a little recessed groove with a knife or chisel.

A Statuette Effect

Of course, there are several alternative methods of treating this figurework which will appeal to the ingenious and original worker. You can paint the figure completely in its proper colours, or you can get a thicker piece of wood and carve it out after the fashion of a statuette, or again you can cut it from the boards shown then just shape off the various edges of the shirt, trousers, legs, etc., to make them more true to life.

By the way, as the grain runs up and down the length of the figure, the Scout stave is likely to be



Fig. 1—An example of bad and good cutting

weak. Leave that, therefore, until the last—even until you have been round the outer edge of the wood.

Here again you may like to be original and put in place an actual piece of dowelling. This will make a very realistic staff instead of the flat piece of wood cut out from the board itself.

Two Opposite Figures

Having completed the figure so far as the cutting out is concerned, it must be cleaned up. Two of these figures are needed and as one is left and one is right-hand, the second one will have to be turned over.

Thus in both cases you have the figure with the flag facing inwards. They are actually glued to the backboard and stood upon the projecting shelf in the position indicated by the dotted lines. Notice that the portion of the figure projects beyond the edge of the backboard.

Below the shelf itself is fitted a fancy hanging rail. This is cut from $\frac{1}{4}$ in. wood, glued on to the back and under the shelf. Get it central, and if necessary screw it from the back.

By the way, screw holes are shown in the

shelf edging position, and these, too, can be applied from the back if desired to give additional strength.

The wording overlay is quite straightforward, but in order to keep the lettering perfect, remember to cut them all in line with each other. A good plan is to run a pencil line right across the top and bottom of the letters, which will act as a guide in cutting.

Do the work carefully, using a fine blade saw and again holding the wood down firmly to the table. These letters can make or mar the whole effect,

MATERIAL SUPPLIED

*Fretwood—For making this Board, the correct thickness of boards of mahogany are supplied for 2/- (post free 2/6)
Fittings—These include two Hangers (No. 6176) 2d. A piece of linen cloth (12 by 3) 4d. Postage on fittings is 2d.
A complete parcel will be sent post paid 3/-*

and the result of good and bad cutting is shown in the detail at Fig. 2.

In using the fretsaw here, keep your eye not only on the actual work you have in hand, but also on the general effect. Notice that all letters are the same thickness, that they stand a certain width apart, and that the outline is straight or curved, according to actual requirements.

Finishing Hints

It is a good plan, too, to complete this first before cutting out the outline. If you have small fretwork files you can use these afterwards to take out any little inaccuracies or any little places where the saw has gone astray.

The good worker should, however, aim at completing his work without the use of these little tools. Do not be afraid, by the way, to have the saw quite tight. It should not bend and "give" during cutting operations, and more workers have a blade too loose than too tight.



Fig. 2—A cut-away view of figure and shelf

Before gluing this overlay on to the backboard, decide whether you are going to do anything more to it. It is intended to be backed up by a piece of linen cloth which is obtainable with the other

material, and this is cut to the outline of the whole overlay and glued on behind.

A dab or two of glue here and there should be sufficient, although of course you can hold the whole thing better by gluing the complete surface. Do not put the glue on so thickly that it squeezes round the letters, because it will be very awkward to get away.

The fellow who likes to use his paint brush may here come in again in decorating

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this overlay in a striking manner. The letters themselves, for instance, can be painted in gold and the surrounding overlay in black or red, or some other distinctive colour.

Or, of course, you can have the wording "The Scout Scarf" in one colour, then the next line "Its many Uses" in another. Then, too, the whole thing is intended to represent a scroll or piece of curled parchment. This scroll effect can be painted on if you wish, or can be further indicated by black lines to give a shaded effect.

A little thought will soon show additional methods which will make a very much more attractive finish, and it is originality such as this which counts.

When the whole of the remainder of the work has been done, we can add the actual pictures

which are supplied full size on the sheet. Cut each of the 12 panels round the outer line, and paste them down in three lines on the backboard.

Remember to keep them in the positions they are on the sheet, because otherwise you will not get them to fit in. The four narrow ones come at the top, the long rectangles of the smaller size come next, whilst the four largest oblongs come along the bottom.

Take some little care in measuring up distances between the pictures to get them even and to keep all in a straight line parallel between the shelf and the upper overlay.

Here again the ingenuity of the individual will probably lead him to redraw these little picture panels and paint them up or finish them in black and white indian ink to be more realistic.

Try your hand at SOAP SCULPTURE

WHITTling in soap is a new branch of the carving hobby, and not only is it much easier, but it has many possibilities because of the more pliable nature of soap, and its effective marble-like appearance.

All you need is a cake of ivory soap, preferably the large laundry size, and a small penknife.

At an American exhibition, nearly 4,000 entries were received in the soap sculpture section, and every possible kind of object had been reproduced in soap—pillars, which were copies of Greek temple pillars, busts of famous men and women, replicas of well known buildings, and dolls used for fashion displays.

A background in any phase of art is useful, when attempting something new, and some of you may already know a great deal about sketching.

The First Job

It is easier to make a soap model if you make a sketch of your figure first. Now, you should begin by blocking out your figure, that is, drawing its outline with the penknife right on the outside surface of your soap.

When doing a person, begin with the nose, because it projects out farthest, then continue with the head and general curve of the face. Be careful to keep all the profile in proportion, and as you cut further down on the figure, shaping the shoulders, the arms, and the body down to the feet, cut round and round, rather than down straight, one side and then down straight the other.

The Soap to Use

Make your models substantial and do not extend the arms of your figure out further than they can be safely placed out of danger of breaking.

Your soap should be moist, not hard or dry, otherwise it will crumble, and do not take too long over the model on which you are working.

You may find it necessary sometimes to join two pieces of soap. This may be done in one of

two ways. You may make a soap solution from soap flakes, boiled until they become jelly-like and by slightly melting the ends of the two pieces to be joined together and gluing them with the soap paste, you will have quite a good join.

A better method perhaps is the free use of wire. To stick a head on a body for instance, you would push some of the wire well down the neck into the body, and then place the head with the wire pushed through on top.

Facial Effects

Eye-brows, eyelashes, and lip rouge effects can be produced with oil paints of the correct colour. Sometimes a little tempera for the slight colour necessary to the cheeks, and real nail varnish can be used to add chic to the hands.

Make minute furniture as background pieces for these figures, and this will prove a source of added pleasure. Thus one may go on experimenting endlessly in new kinds of figures and objects, trying the use of paint and other artificial colourings for decorative effects.

Or Clay Figures

Soap sculpture may well lead you to other stages more advanced in the art of modelling. Clay figures may have the same proportions as your figures in soap, but the technique of course is different. With clay, one takes a small mound of the material and adds more dabs of clay to it, until he has well rounded out the finished figure.

But models in both soap and clay may be cast in plaster and then in bronze. So your seemingly unimportant piece of work in an inexpensive medium may suddenly be the means to an even more beautiful result.

That introduces the whole fine arts angle of soap carving. If you are only interested in the use of soap, it is indeed a fascinating hobby, but if you wish, you can advance your art, and carry it through to channels where profits await you as a professional sculptor.

DOLL'S HOUSE MODEL SINK

THE second of our series of new Doll's House accessories is shown here, whilst the patterns are given in the centre pages of this issue. The previous design was for making a small folding ironing board, and now we have a typical modern sink which can be fitted into any ordinary doll's kitchen.

The complete height is 6ins. and the whole thing stands on a base $7\frac{1}{4}$ ins. long and 3ins. wide. It can thus be made as a separate component, and fitted into the corner of a kitchen or even, of course, built in permanently if desired.

Odd Pieces of Wood

The material used can be fretwood or plywood because it is as well to paint the finished article white. As can be seen in the picture, the completed model consists of a deep sink with draining board at the side, and a cupboard beneath.

It is quite a realistic piece of work, and can be made from a few odd pieces of board with the fretsaw. Begin by cutting out the base to the size shown.

The patterns, by the way, can be marked off by laying them on the wood then pricking a hole through at the corners, joining the holes up with pencil afterwards. Or, of course, where certain ones of them have to be extended as in the case of the sink end, bottom, etc., the dimensions are marked out as shown.

Commencing Construction

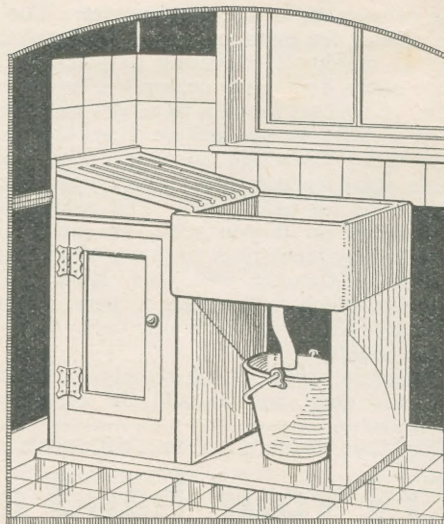
To return to the construction, however, the base is $\frac{3}{16}$ in. and on it you must build two upright supports for the sink itself and a third upright end to the cupboard and draining board. The sink is built of a bottom piece round the edges of which are stood the two ends and the back and front.

The top edge of all these side pieces is rounded with a piece of glasspaper, and the parts must be glued very securely to the sink bottom. Then the whole thing is stood on the two upright supports and there glued.

The Door

The front of the cupboard provides the opening for the door and a sawcut is run round between the two lines on the pattern to provide this. Make your first drill hole in one of the corners so it may not be conspicuous, or better still, make it where one of the hinges will hide it when fitted.

To form the centre panel for the door, the centre of it is cut out where it says "glue the backing piece behind this." The backing piece itself of $\frac{1}{16}$ in. material is glued on behind the door.



Full size patterns on centre pages

Clean the parts up thoroughly then add the hinges and knob in the position shown. The whole board and framework forming the front of the cupboard is stood on the base and glued between the upright end and the sink support, and, of course, to the sink itself.

A Cupboard Shelf

There is a little shelf to be put in the cupboard, which is held up by little wooden strips, and when fitted the shelf itself forms the stop to prevent the door falling inwards.

The draining board is a piece of $\frac{3}{16}$ in. material in which six grooved pieces are sunk by means of a gouge or knife and glasspaper.

Do them carefully, do not extend them the full length, and stop them off $\frac{1}{4}$ in. from the top. Get them nicely rounded as shown by the section.

The top end, of course, must be chamfered to an angle to allow the board to lie on the slope formed by the cupboard top. Glue it in place so that it actually overhangs the sink slightly.

Painted Finish

The completed model can be enamelled white with the actual draining board stained darker and left in its natural state. Do not paint this. Add the little plug to the sink if you wish, and even run a pipe out to lead through the back.

The wall round the sink can be marked off for tiling or better still can have the proper kitchen tile paper pasted on. It is obtainable quite cheaply from Hobbies.

If you wish, Hobbies Ltd. can supply a special parcel of wood for this model. The boards are in the thicknesses required and cut square to the size needed for each part. Price is obtainable on request and you should mention Design S.D. 19 when you apply.

Readers should write for the Free Booklet all about the advantages of the Hobbies League

MAKING A 12ft. 6in. CANVAS CANOE

THE sport of canoeing is becoming more and more popular each year and it is very common to see canvas canoes on the Thames, on other rivers and even on the sea.

A manufactured canvas canoe is rather expensive, the cheapest costing about 5 guineas. But here we have a design for a canvas canoe which will carry two people and skim over the water like something alive and the cost of making is only about 35/- to 40/-

The Keel

The first thing needed for the construction of this craft is a piece of clean deal 12ft. by 2ins. by 12ins., which must be planed all over. This is for the keel. Now leave this for a time while the stem and stern posts are made.

These are of oak as they have to stand up to some hard knocks and can be cut out of a 1ft. 6in. by 1ft. by 1in. piece of curly grained oak (see Fig. 2).

Then fix the stem and stern posts to the keel This should be done by a scarf joint as in Fig. 3.

The Frames

The frames take a great strain and must therefore be made carefully. They should be cut out of 1in. deal or pine and must be cut out with a bowsaw and smoothed off with a spokeshave (see Fig. 4). There is a groove cut at A which must be the thickness of the keel and $\frac{3}{4}$ in. deep to fit into a similar one in the keel. Make sure that these fit well and glue and screw them to the keel, the screw coming from underneath.

All screws *must* be brass as iron ones will rust and rot the wood around them.

The gunwales also have to take a great strain when the boat comes alongside the bank or landing

stage and while getting in and out of the boat she will bump.

Take two 14ft. by $\frac{1}{2}$ in. by 2in. pieces of deal, clean and free from knots. Then mark a line 1in below the top of the stem and stern posts on each side. Below that set another line parallel to the first, 2ins. below it. The gunwales will be fitted to the stem and stern posts in these places.

Now bevel off one end of the first gunwale and screw it to the stem post with three No. 6 $\frac{1}{4}$ in. brass screws. Then draw the gunwale round until it is at No. 1 frame (see Fig. 5) and screw with two of the same size screws. Then draw it round until it comes to No. 2 frame (Fig. 5) and screw in the same way.

Now cut off at the required length, bevel off and screw with three more of the same size screws. The other gunwale is fixed in the same way.

The cockpit and deck are not finished until the canvas has been put on, but first of all the cockpit must be formed. This is done by running two ribs from frame to frame 3ins. from the gunwales (see Fig. 6.)

These should be 2ins. by 1in. deal and fitted by means of fillets and brackets (Fig. 6).

Then the centre rib has to be fitted. These also are of 2in. by 1in. deal and must be fitted from the stem and stern posts to the middle of the top of the frames, Fig. 6.

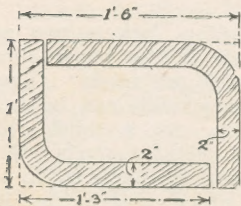
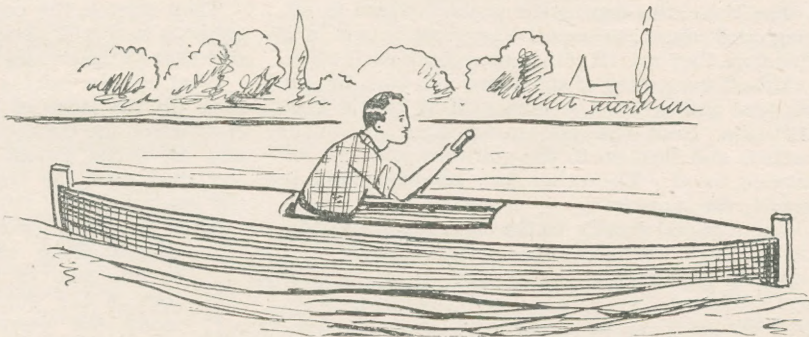


Fig. 2—Stem and stern Posts cut from one piece

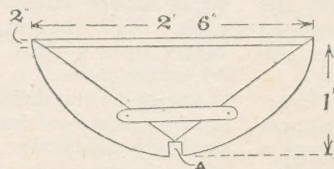


Fig. 4—The frames for the deck and battens



Fig. 3—The scarf joint in the keel



Fig. 7—End section showing battens

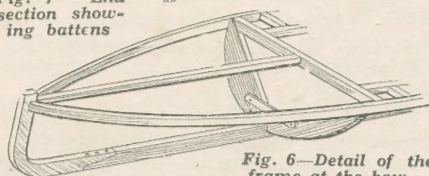


Fig. 6—Detail of the frame at the bow

Go to a good timber yard and ask for ten pieces of $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by 14 ft. pieces of pine. Tell the merchant that if there are any flaws in the wood it will be useless. These battens are fitted to the posts and frames the same way as the gunwales (Fig. 6).

Ribs

The three ribs are in the cockpit which is 6 ft. long and must be equal distances apart and therefore, they are 1 ft. 6 ins. away from each other.

Take three pieces of stripwood 4 ft. 6 ins. by 1 in. by $\frac{1}{4}$ in. and screw the centre of it to the keel, 1 ft. 6 ins. from the 1st frame screw to all the battens and then on to the gunwales and cut off surplus wood. The other two ribs are fixed in exactly the same way.

The ribs add greatly to the strength of the boat

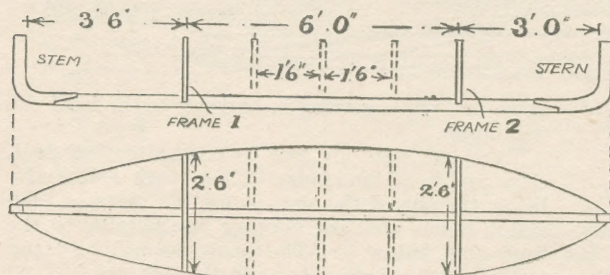


Fig. 5—A section and plan view with dimensions

and keep the craft in its original shape. They should be steamed to make them bend more easily before putting on. Three will be sufficient and they must be screwed on to each batten and the gunwales (Fig. 7.)

Before the canvas covering is put on, the whole of the framework must be well glasspapered and sharp edges taken off.

Covering the Frame

Now we come to the covering. Some people prefer to use a 13 oz. white duck canvas for this kind of craft but the writer prefers unbleached calico which is found quite stout enough. This is much cheaper than 13 oz. canvas and will also keep the weight lower and the cost of transport will be cheaper.

Turn the frame over with the keel upwards and tack from keel to gunwales. The canvas should be tacked along the side of the keel, the edges having been turned over to add to the strength. The tacks should be about 1 $\frac{1}{2}$ ins. apart at the keel and $\frac{1}{2}$ in. copper or galvanised tacks should be used.

Length of Canvas

Then stretch the covering tightly down to the gunwale and tack along the top of it, first making sure that all the creases are removed.

Next cut the canvas to the required length and tack up the sides of the stem and stern posts. Now cover the decks in the same way. The fore and aft decks should be of one piece of calico stretched over the centre rib and tacked on to the gunwales.

Then we come to the side decks. A strip is placed along each side and tacked on to the side of the side rib and on to the top of the gunwales. Put fillet strips along the gunwales to cover the tacks which will also prevent the canvas being rubbed when coming alongside the bank.

Waterproofing and Painting

Your canoe is now ready for waterproofing and painting. The best way to do this is to paint the covering with two coats of linseed oil. When this is dry, paint the outside with a good lead paint giving it a good thick coat and then a thin one to finish off. Give the inside one a coat also.

Green, blue and red are good colours for the outside and white is always the right colour for the inside.

The floor grating is made of four 6 ft. by 2 in. by $\frac{1}{2}$ in. pieces of deal being laid across four pieces of 1 in. square deal and screwed with 1 $\frac{1}{2}$ in. No. 6 brass screws.

You now have a fine little craft which will carry you through calm and quite rough seas and will give you hours of healthy exercise and entertainment in the fine weather.

Mechanical Grinder—(Continued from Opposite page)

When cut out, glue the body part to the tenoned leg part so the body is bent forward as in the illustration. The leg pieces are then pinned in place to work freely and the leg glued to the base mortise.

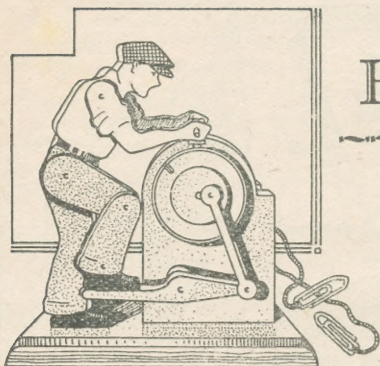
The arms are held with a single pin which is cut to project $\frac{1}{4}$ in. and bent over. The arms must hang loosely when the hammer (consisting of a rounded match in a small piece of $\frac{1}{4}$ in. dowelling having flints in both ends) is forced in the hand holes.

Having attached the leg piece to the outside of the boot of the figure on the treadle, make necessary adjustment via the treadle dowel shafting. Short lengths of flex are connected

(not soldered) to the motor terminals, after which paper clips or wireless plugs are affixed to the other ends. With the plugs, the article can be worked better from a Grid Bias (9-volt) battery costing 6d. at the stores.

Owing to the different voltage sockets, you can get a variety of speed. With the paper clips, ordinary flashlamp batteries are used. If you desire increased voltage, two refills can be connected together in series. As a finish, the novelty is best coloured in bright enamels. Remove the motor and all working parts to do so. When dry, clear all holes which must be free for movement. A $\frac{1}{4}$ in. thick base could be glued to the other if desired.

A MECHANICAL ELECTRIC GRINDER



WE show another electrical novelty which entails the use of a miniature motor. It would be quite easy, however, to omit the motor and fit an axle and a pulley in the stand and grindstone wheel for working from a model steam engine or a different type of motor.

If, too, the opposite end of the axle had a handle, you would also get effective results if turned fairly quickly.

Quickly? Yes, you see, apart from doing his realistic, mechanical actions, the workman—in grinding the face of a hammer—causes sparks to fly out from the revolving stone, this being due to a piece of cigarette-lighter flint projecting from the hammer face which rubs on emery cloth or glasspaper glued around the circumference of the wheel.

Stand and Base

If desired, the motor supports (Fig. 1) could be cut from $\frac{1}{8}$ in. plywood as is the base piece (Fig. 3). Allowance has been made in the base mortises for $\frac{1}{8}$ in. stuff, so this must be corrected—and from the *inside* only so that the mortises remain $\frac{1}{8}$ in. apart. The motor measures $1\frac{1}{8}$ ins. long by $\frac{1}{8}$ in. diam. and must be flush with the supports at each end.

When cut out, glue the supports to the base, then insert an $1\frac{1}{8}$ in. length of $\frac{3}{16}$ in. dowelling into

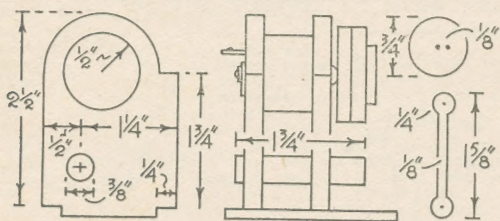


Fig. 1—
Motor supports

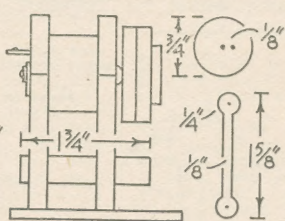


Fig. 2—End elevation with
pitman and front disc

the holes provided to protrude as seen by the elevation at Fig. 2. The dowel must fit tight and not be glued in view of adjustment later.

Having fixed the motor temporarily in the supports (it should fit in tightly or be bound with adhesive tape if found essential), cut two grindstone wheels $1\frac{1}{8}$ ins. diam. by $\frac{3}{16}$ in. thick and glue them together.

When glasspapered even, make a saw cut

through the circumference about $\frac{1}{8}$ in. deep (see sketch), then fit a $\frac{3}{8}$ in. wide strip of emery cloth or glasspaper around so the ends fit in the saw kerf. The strip is then glued securely around the wheel, the rough side uppermost, of course.

Pitman, Treadle, Etc.

Drill a central hole through the grindstone to suit the shafting of the motor; the wheel should fit tight on same. The front disc (Fig. 2) is cut from $\frac{1}{8}$ in. material and then centrally drilled to take the projection of the motor shaft.

The eccentric hole (for connecting the pitman) should be made with a pin. The pitman is cut from $\frac{1}{16}$ in. plywood; the holes in same are made slightly larger to ensure freedom.

The treadle is cut from $\frac{1}{8}$ in. plywood, same having a boot belonging to the statuette. The central hole is drilled to take a small roundhead brass screw fairly loosely or a pin. The end pin holes should be just neat and no more.

MATERIALS REQUIRED

- 1 piece plywood—6 ins. by 4 ins. by $\frac{1}{8}$ in. thick.
- 1 base piece—3 ins. by 2 ins. by $\frac{1}{8}$ in. thick.
- 1 ditto—4 ins. by 2 ins. by $\frac{1}{8}$ in. thick.
- 2 support pieces—3 ins. by $\frac{1}{8}$ in. by $\frac{1}{8}$ in. thick.
- 1 piece plywood—6 ins. by 6 ins. by $\frac{1}{16}$ in. thick.
- 1 piece dowel—2 ins. by $\frac{1}{8}$ in. diam.
- 2 grindstone discs—18 ins. by 18 ins. by $\frac{3}{16}$ in. thick.
- 1 "Maimon" motor.
- 1 Grid Bias battery.
- 2 wireless plugs, with flex.

Pin the pitman to the treadle end and cut the projection flush with the back. Screw or pin the treadle to the dowel and affix the other end of the pitman to the disc which is glued to the centre of the grindstone.

Statuette Parts

The tenoned leg of the statuette is cut from $\frac{1}{8}$ in. plywood, including the body piece. The other parts are cut from $\frac{1}{16}$ in. stuff. In marking out, be sure to indicate the pin pivot positions as shown.

(Continued foot of opposite page)

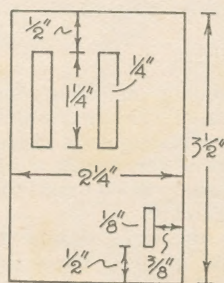


Fig. 3—Details of base

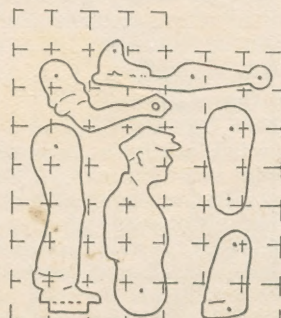


Fig. 4—Outline of figure parts
in $\frac{1}{16}$ in. squares



THERE are very few cyclists who can manage to do without a cycle bag of some sort or other, but the cost of the type one sees in the shops is so often prohibitive, that one has either to go without altogether, or to put up with an article quite inadequate.

This article is a boon to all cyclists who can handle a few simple tools. It is a cycle bag in thin plywood, which will be no heavier than one in canvas the same size, and considerably lighter than one in leather.

A plywood carrier is amazingly strong if well made, and, with reasonable use should last almost indefinitely. The only danger is that, should the bicycle fall over, the carrier might get considerably damaged, but no more so than a tear damages a cloth one.

The great advantages of construction in wood are these—you can make the carrier exactly what size and shape is necessary for your needs.

First of all, it is necessary to plan out on paper exactly what you want. It is then a simple matter to obtain from this plan what quantity of

These nails form excellent and cheap rivets, but you can, if you like, use proper split copper ones, although these are sometimes difficult to obtain thin enough, and of course, cost more.

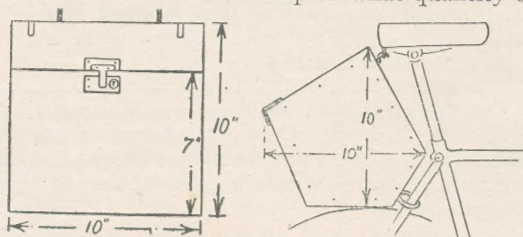
Now comes the more difficult part of the job. Proceed to glue and nail, at the same time (the glue will not set without the support of the nails), the rectangular pieces, with the exception of the top, to their respective edges, on one side only.

When this is done, insert the other side at the opposite edges of the rectangular pieces, and glue and nail it to them, as with the other side. If the shape is irregular, difficulty may be experienced in nailing this latter part of the process, because of the task of getting suitable supports under the edging strips. But by the use of a bit of ingenuity, this can be overcome. The projecting nail points inside must again be bent over.

Stiffen the Corners

When the glue has set, cornering strips, shaped to fit their own particular angles, should be glued where the front, base and backs, run alongside each other, and the top opening lined with $\frac{1}{4}$ in. by $\frac{1}{4}$ in. canary wood, except the back edge, which should have a piece of hardwood $\frac{1}{2}$ in. by $\frac{3}{4}$ in. securely fastened.

The top of $\frac{1}{4}$ in. stuff must now be hinged on the outside, preferably with long slender brass hinges. A good method of securing these is with narrow bolts, which are required only $\frac{1}{4}$ in. long to go



A rear and side view with dimensions

wood will be needed—about four feet by four feet should be enough for a big carrier.

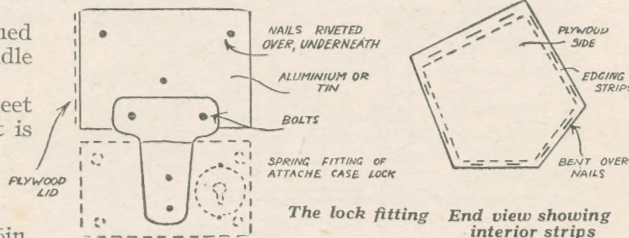
The sketches show a carrier made and designed to fit into the shape formed by the saddle, saddle tree, frame, and mudguard.

The size can, of course, be varied to meet individual requirements, but remember that it is better to reduce the width rather than the height or depth.

Cut Out in Plywood

Now cut the necessary shapes out of $\frac{1}{16}$ in. plywood, with the exception of the top, which should be of $\frac{1}{8}$ in. stuff. Then taking each of the two sides in turn, glue lengths of $\frac{1}{2}$ in. square stuff, preferably of satin walnut or canary wood round the inside edges as shown in the sketch B.

Fairly thick, flat headed, $\frac{3}{4}$ in. nails should be driven through plywood and edging, from the outside, and the projections of $\frac{1}{4}$ in., bent over to serve as rivets. About two or three are used to each length as shown.



through the top, and $\frac{3}{4}$ in. long to go through the hardwood strip at the back. These bolts should be riveted over.

An attache case fitting, costing only a few pence and obtainable from Hobbies, can be put on the front of the lid, and should be fixed in the manner indicated in sketch A. To finish, the box should be painted with black enamel. You will be surprised how much like the other type of bag it appears.

The AMATEUR



ELECTRICIAN

A POWERFUL PRIMARY BATTERY



AN endless number of interesting and instructive electrical experiments can be carried out by the amateur electrician provided a supply of electric current is available. It is risky however to experiment with current taken from the house mains as there is always a possibility of the learner getting burns or unpleasant shocks from these high voltage currents, or else blowing the fuses and putting out the lights.

Besides this objection, current from the mains is usually "alternating," which limits considerably the range of experiments that can be carried out with it, so that in order to obtain a supply of "direct" or continuous current the only alternatives are the Dynamo, the Accumulator, or the Primary Battery.

Dynamo Drives

Dynamos need an engine to drive them or some form of motive power other than manual labour, the cost of the whole equipment usually being beyond the means of the youthful experimenter.

Accumulators are also costly to buy, and a continual source of expense for re-charging when they run down.

The primary battery, on the other hand, as a source of low-voltage direct current, free from any danger of "shocks," is often the only solution of the difficulty, and a really powerful battery is not difficult to make up, nor does it cost nearly as much as the dynamo or the accumulator for the same output capacity.

Batteries in General

The principal difficulty so far as the amateur is concerned is to decide which, out of many different

types of cell, to choose. They are a very numerous family and give widely different performances. Some are known as "wet" cells, others as "dry" cells. Some are suitable for only very small current discharges over a long period of time, others will give far heavier currents but for a short time only comparatively.

Voltage

The voltage or Electromotive Force per cell also varies considerably with different types. That is, the electrical pressure by which the cell is able to drive current round the circuit. Even when two different types of cell happen to give identical voltages it does not necessarily follow that both can give the same output of current, since one may have a much higher "internal resistance" than the other.

Resistance is usually the chief factor in an electric circuit which limits the current set up by a definite electromotive force. But there is more than one source of resistance in the circuit. Not only in the lamps or other apparatus connected to it but residing in the cell itself, whose internal resistance is greater or lesser according to its construction.

Cells and Resistance

Broadly speaking, all cells of the single-fluid type have a lower resistance than those of the double-fluid type containing a porous pot or partition enclosing one of the elements.

The larger the size of the elements or electrodes, and the closer they come together in the fluid, the lower will be the internal resistance and consequently the greater the output of current in amperes.

But the size of the plates does not affect the voltage of the cell. This depends on chemical action alone, which is equally vigorous whether the plates are large or small.

The Chromic Acid Battery

One of the most powerful primary cells, and one in which all materials are reasonably cheap, is the Chromic Acid Cell. This is a single-fluid type, having zinc and carbon plates for its elements immersed in a solution of dilute sulphuric and chromic acids.

Its electromotive force is 2 volts per cell, which is higher than most other types, and it can be made

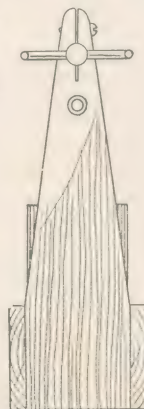
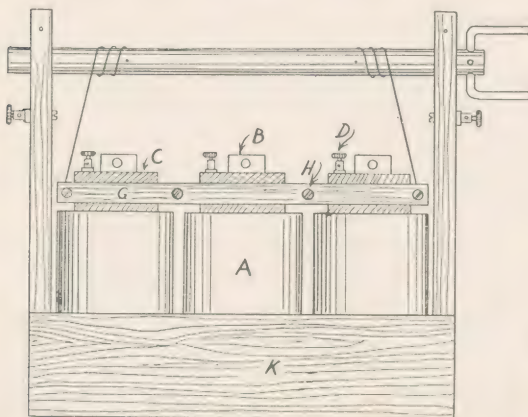


Fig. 1—Side view of battery complete with lifting gear Fig. 2—End view of ditto

with an extremely low internal resistance so that it will give a heavy current output in amperes.

Any voltage is obtainable in multiples of 2 by coupling up a number of cells in series to form a battery. That is, with the carbon of one cell connected to the zinc plate of the next, each cell thus adding its voltage to that of its predecessor. Three chromic acid cells coupled in series will give a total of 6 volts, and with two carbons and one zinc plate per cell, about 2½ ins. by 4 ins. will, when fully immersed in the solution, give an output of 5 amperes at least.

Polarisation

One of the weaknesses to which all primary cells are subject is that of "polarisation." By this is meant the chemical action which causes bubbles of hydrogen gas to collect on the plates when the cell is at work.

As these adhere to the plates in increasing numbers, it restricts the amount of active surface exposed to the liquid, which is equivalent to increasing its internal resistance since gas is an insulator. Consequently the current begins to drop off unless these bubbles can be dispersed.

For this reason what is known as a "depolariser" is employed when making up the solution. In the

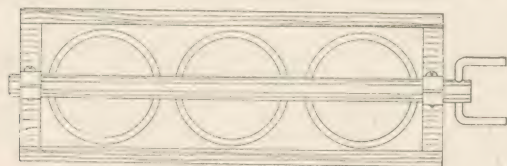


Fig. 3—Top view of same

present type of cell it is the chromic acid which fulfils this duty, producing oxygen which combines with the hydrogen bubbles on the plates to form water.

Amalgamation

A useful preventive against wastage of the zinc when the battery is idle is to amalgamate them with mercury before the parts are assembled. This is done by dipping the zincs in a ten per cent solution of sulphuric or nitric acid and dropping a few globules of mercury on to the surface.

A coating of mercury can then be spread over the whole plate by rubbing it with a pad of clean rag and draining off any surplus mercury. The zincs should then keep as bright as though silver-plated. Wash the hands carefully after this operation, and avoid getting the amalgam into any cuts or scratches.

Materials Required

The material needed for making up the battery as here illustrated and described include the following parts, the letter references corresponding with those on the drawings :—

- A. Three glazed earthenware battery jars, 3½ ins. outside diam. by 6 ins. high. Alternatively square glass jars such as used for No. 2 size Leclanché bell batteries can be employed, as these are obtainable from all electrical stores.
- B. Three rolled (not cast) zinc plates, 2½ ins. wide by 7 ins. high by ¼ in. thick.

- C. Six carbon plates 2½ ins. wide by 6 ins. high by ¼ in. thick. Cut carbons are preferable to the moulded carbons.
- D. Eight brass terminals with screwed shanks, about ⅜ in. diam.
- E. Six pieces of brass strip ½ in. wide by 3 ins. long by 26 B.W.G. to make bridges for connecting the carbons in pairs.
- F. Two strips of vulcanized fibre sheet ¾ in. by 3/16 in. by 11 ins. long.
- G. Two strips of beech or oak 1 in. by ¾ ins. by 11 ins.
- H. Four brass rods 3/16 ins. diam. by 2½ ins. long, threaded 2 B.A. at each end and provided with nuts and washers.
- J. Half a pint of "Anti-sulphuric" Enamel, black or red.
- K. Sufficient ⅜ in. by 5 ins. planed and thick-nessed deal for making the battery box as shown, about ten feet in all.

We can tell readers where to get all these materials if they wish.

Regulation of Output

The containing case is optional, but is a great convenience in use. Not only can the whole battery be carried about by it, but the top roller with its cords and lifting arrangement enables the plates to be partially or totally immersed, or even drawn out of the solution altogether.

This is a special feature, as it prevents wastage

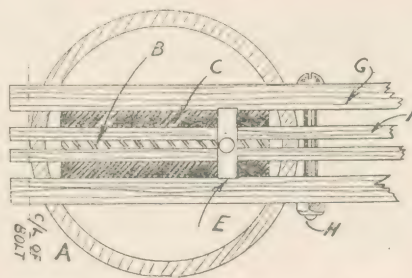


Fig. 4—Enlarged sketch showing assembly of battery plates and method of clamping together

of the plates when the battery is not in use, while the current output when at work can be regulated to a nicety by lowering or raising the plates in the solution, giving the same control as though the circuit were provided with a variable resistance, as well as an off-and-on switch.

Battery Solution

The exciting solution for this battery is made up as follows :—

- Chromic acid—9 oz. by weight.
- Chlorate of Potash—1½ oz. by weight.
- Sulphuric Acid—4½ ozs. by measure.
- Water—3 pints by measure.

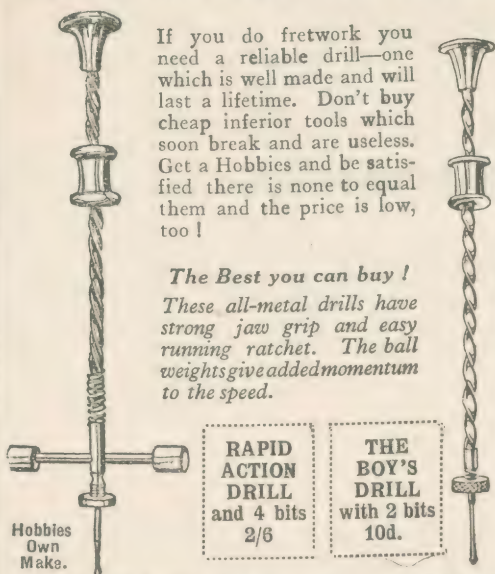
Pour the sulphuric acid slowly into the cold water, stirring well, and while still warm add the chromic acid and lastly the chlorate of potash. The solution must be quite cold before filling the cells.

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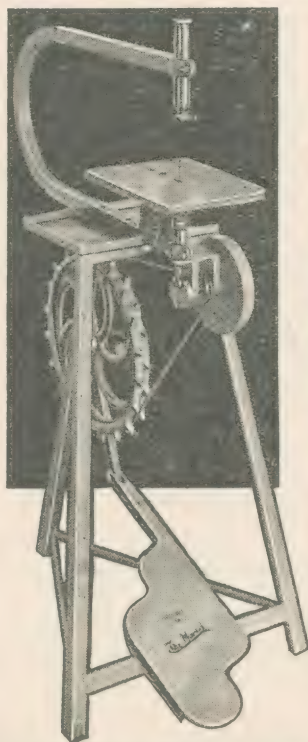


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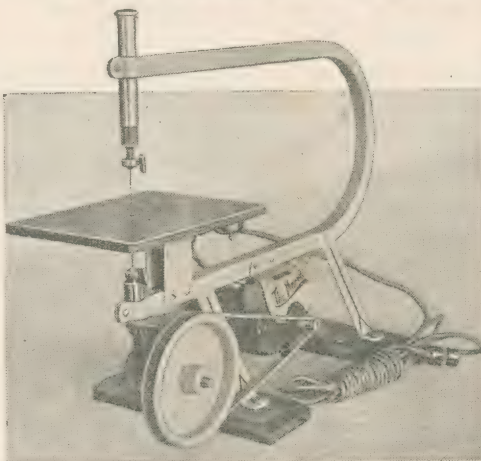


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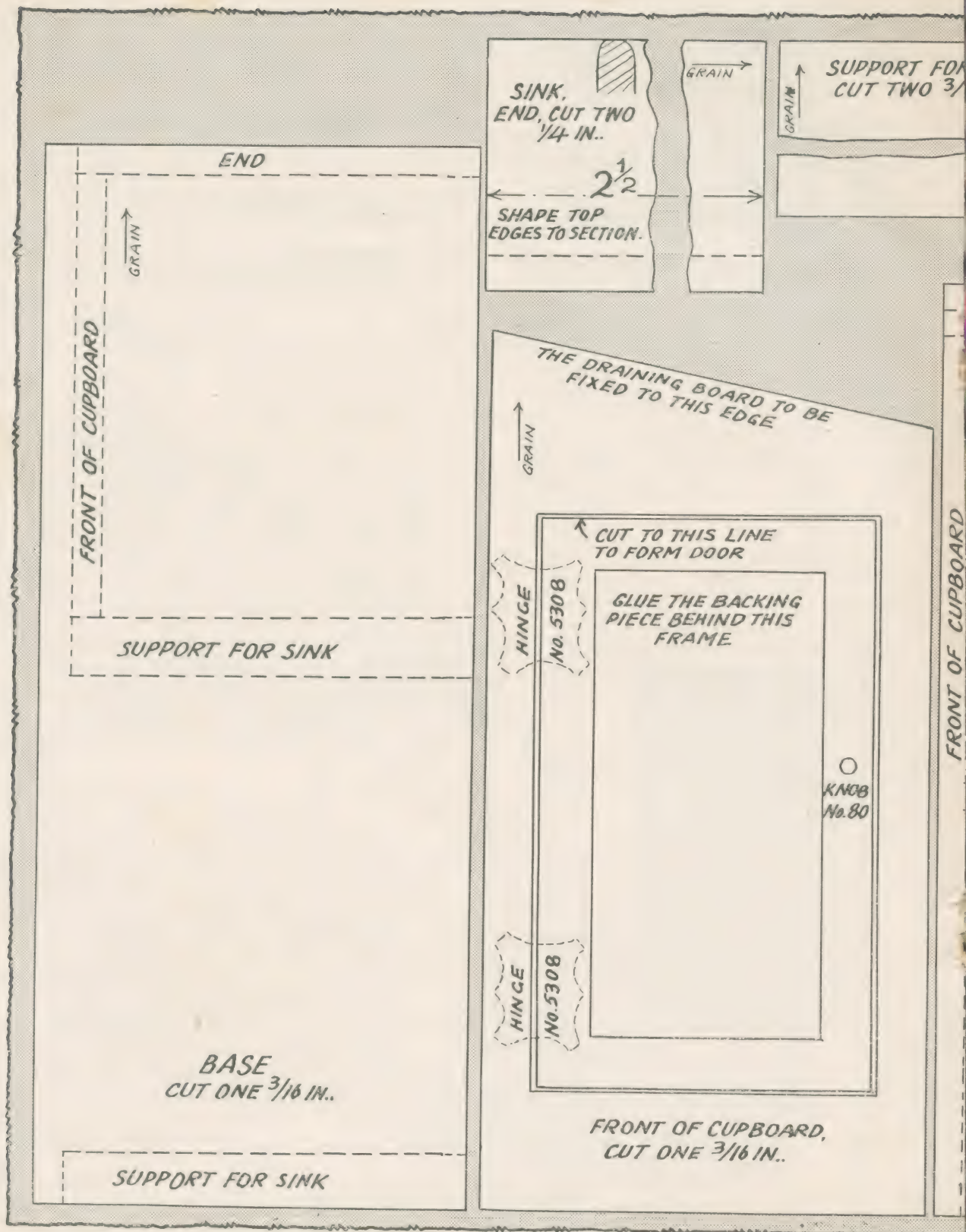
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Treadle Machine as Shown. Carriage Forward.



SINK,
8 IN..

3 ⁵/₈"

GRAIN →

CUPBOARD SHELF.
CUT ONE ³/₁₆ IN..

2 ¹/₂"

GRAIN →

FRONT

END

GRAIN ↑

SECTION

SINK.
FRONT AND BACK,
CUT ONE OF EACH
¹/₄ IN..

SHAPE TOP
EDGES TO SECTION.

BOTTOM

END

GRAIN ←

TOP

BACKING TO
DOOR

BOTTOM
OF SINK,
CUT ONE ¹/₄ IN..

CUT ONE
¹/₁₆ IN..

DOLL'S KITCHEN SINK

For details
see page 100

DESIGN S.D. 19

SHELF

THIS EDGE OF SHELF
FORMS STOP FOR DOOR

DRAINING BOARD, CUT ONE ³/₁₆ IN..

PUT GROOVES IN WITH A GOUGE OR KNIFE
TO THE SECTION SHOWN

SECTION

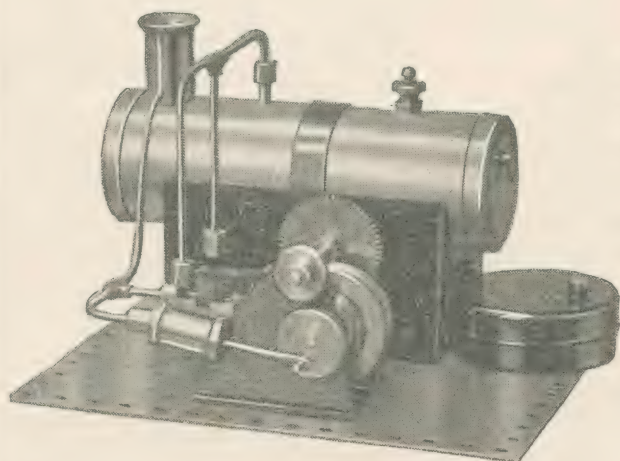
CHAMFER THIS EDGE
TO FIT SIDE OF
CUPBOARD.

GRAIN ←

SIDE OF CUPBOARD.
CUT ONE ³/₁₆ IN..

POWER..!

Hobbies Steam Engines are "engineer-made." That's the secret of their extra power. They are utterly different from the usual "toy-shop" kind. Boilers tested to 100 lbs. pressure. Safety valves that really **do** work. To give realism to your model, drive it with the real thing . . . a Hobbies steam engine!



MODEL S.E.2

(As Illustrated above)

Boiler 4ins. long, fitted with safety valve and overflow tap. Tested to 100lbs. Exhaust to funnel. Cylinder bored from the solid. Reduction gear has two pulleys. Shaft fits Meccano pulleys. Metal base $5\frac{1}{2}$ by $5\frac{1}{2}$ ins.

12/6

Post 6d.



MODEL S.E.4

This magnificent model has a boiler 6ins. long by 2ins. dia. Tested to 100lbs. and fitted with safety valve and overflow tap. The twin-cylinders are bored from the solid. Exhaust to funnel. Cylinders and engine frame of cast brass. Two-speed reduction gear with pulleys. Shaft fits Meccano pulleys. Metal base $7\frac{1}{2}$ by 6 $\frac{1}{2}$ ins.

26/-

Post 8d.

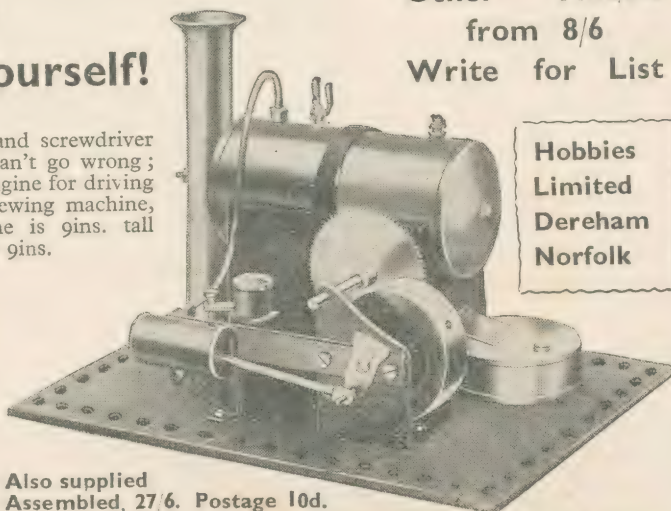
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No soldering, no mess! A spanner and screwdriver are the only tools you need. You can't go wrong; it's dead easy to make up a first-class engine for driving your Trix and Fretwork models, a sewing machine, or a dynamo. The completed engine is 9ins. tall and stands on a metal base, 11ins. by 9ins.

It is utterly different from the ordinary toy-shop engine. The flywheel alone weighs 1lb., whilst the total weight is about 7lbs.

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A SMALL TOY SAILING BOAT

THE type of sailing yacht shown in our illustration on this page is always popular with our young readers, and in response to many requests for such a design, we are giving full details this week. Such a boat as shown here is sure to afford endless fun to the youngster, and it is very easy to build from a few odd pieces of wood.

The boat, without the bowsprit, measures 10 ins. long with a beam of 5 ins., this latter measurement appearing to be somewhat great but necessary in keeping the boat from toppling over when the mast and sail are installed.

The Hull

The hull is a piece of 1 in. thick deal with no knots. Set out the shape direct on the wood according to the measurements given in Fig. 1, and cut round with the fretsaw, afterwards cleaning up with glasspaper. Cut the little notch in at the bow for piece E, and next cut piece B.

This will measure 3½ ins. by 1 in. by ½ in. thick and will be securely glued on as shown in Figs. 2 and 3.

The crosspieces C and D are made up of two thicknesses of ½ in. stuff pinned together and nailed to the top of the hull (see Fig. 1). Clean off the ends after they are put on, so the correct curve of the hull is preserved.

The bow upright (E) is 2½ ins. long, ½ in. wide and ½ in. thick, and is fitted in and glued tightly in the notch in the hull.

The Sides

For the sides (F) take the measurement direct from the made-up hull, allowing a trifle in length for chamfering and fitting to the bow upright. Wood 1/16 in. thick is suggested for the sides. They are made slightly tapering from 1½ ins. at the

bow to 1¼ ins. at the stern. The lower edges of the pieces, however, must be kept at right-angles with the edge which adjoins the bow.

Bore holes carefully in the thin wood, and after coating the top part of the hull with glue, bend it round and fix it with ¼ in. brass fret pins ¾ in. apart. A general clean up should now be made, and the sides and hull gone over with very fine glasspaper.

The stern post (G) is next cut, glued and pinned on. It measures 2¼ ins. by ½ in. by ¼ in.

The whole boat should be coated with red lead paint and afterwards rubbed down and followed with two coats of oil paint brushed well into the grain.

For the rudder (H) a piece of ¼ in. wood about 2½ ins. long is shaped as shown in Fig. 4, and fitted with two small brass eyes. Two similar eyes in the stern post fit under those in the rudder, which is held in place by a pin of bent brass.

The rudder should thus swivel easily, and be controlled by a tiller arm of wire which is bent to shape and pointed at one end and driven into the top arm of the rudder.

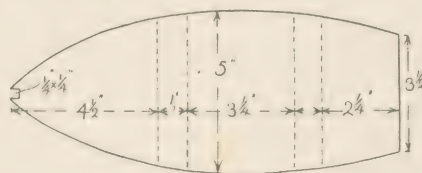


Fig. 1—Dimensions of main hull

A hole must be bored in the foremost crosspiece of the boat to take the mast which is shaped up from a piece of ¼ in. dowel rod. The mast is 8 or 8½ ins. long, and the spar for the sail 5 ins. long, tapering off from 3/16 in. in the middle to ¼ in. at the ends.

The sail should be gauged from the mast and spar when temporarily put together. Two brass eyes are run into the top of the board B to take the sail cords which are carried up and fastened to the ends of the sail spar.

The bowsprit should be tapered from a piece of 3/16 in. rod and let into the cross piece just near the base of the mast.

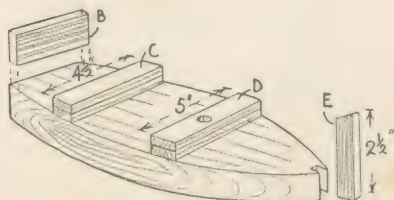


Fig. 2—The main hull carcass

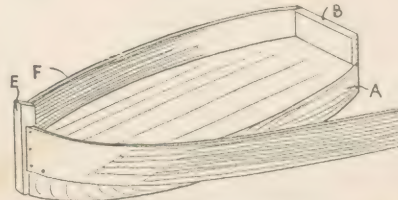


Fig. 3—Fitting the sides

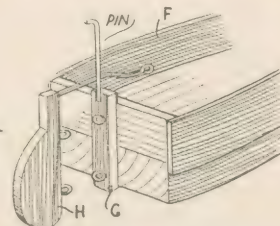


Fig. 4—The stern post and rudder

NOVEL WINDMILL ELECTRIC FAN

THE illustration hardly does justice to the novel little Electric Fan to be described. It will, however, serve to give you some idea of the finished work which is coloured in bright enamels.

The construction is plain and simple, while the mechanism is provided by a "Daimon" miniature electric motor costing 5s. 9d. post free from an address to be supplied. This tiny 3-volt motor can be used for other purposes where lightness (it weighs $1\frac{1}{2}$ ozs.) and smallness is necessary, the size being $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ in. diam.

Naturally, the "sails" of the windmill turn too quickly to suggest true realism, but if an almost exhausted 2-cell battery is installed in place of a new one, you will obtain the desired effect. The switch is situated on the roof of the house at the back, while the battery is housed at the back of the mill.

The Front and Back

The front and back gables of the mill are cut the same size and shape seen at Fig. 1, the former being cut from $\frac{1}{2}$ in. deal and the latter from $\frac{3}{4}$ in. stuff.

When marking out the shape, ignore the outline of the door platform as this is cut independently from $\frac{3}{8}$ in. thick material. The dotted lines indicate the aperture to be cut in the back gable for the battery. The battery fits in endwise so that one half projects.

The windows and doors in all parts, by the way, are cut $\frac{1}{8}$ in. deep with a chisel prior to assembly. The mill gables are glued together at this juncture and made even at the join with a rasp and coarse glasspaper.

This also applies to the parts of the motor housing which are cut identical from $\frac{1}{2}$ in. and $\frac{3}{4}$ in. stuff or two from $\frac{3}{8}$ in. stuff. The $1\frac{1}{2}$ in. diam. hole is best made with a suitable centre bit in a large piece of wood before cutting the shape.

Base and House

Having made the motor housing, cut an $1\frac{1}{2}$ in.

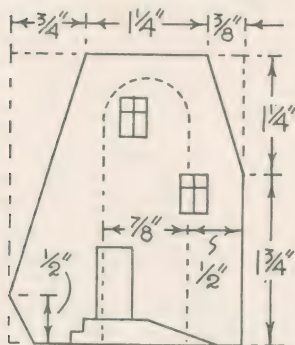


Fig. 1—Details of mill front

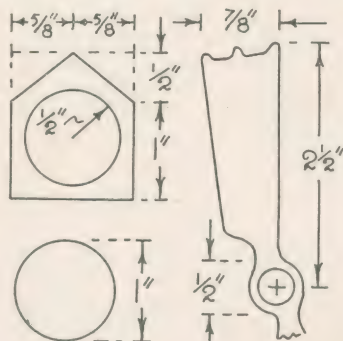
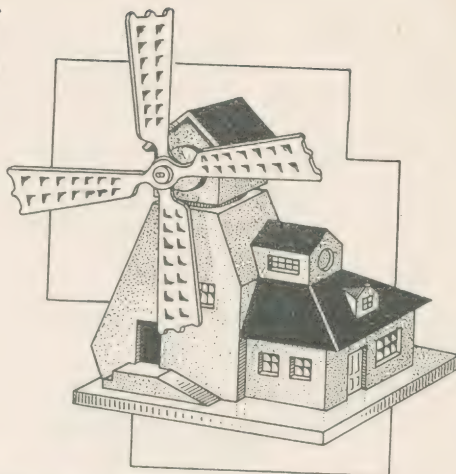


Fig. 2—The motor housing, base disc and vanes



disc (see Fig. 2) from $\frac{1}{2}$ in. wood and screw in firmly, but freely to the centre of the mill gables at the top. Use a flathead screw and countersink the wood so the head is slightly below the surface.

The motor housing is glued evenly on top after the roof pieces have been glued on same to protrude in the manner suggested in the sketch. This little arrangement allows the "vaness" to be swerved slightly.

The work so far is glued to a base measuring $4\frac{1}{2}$ ins. by 3 ins. by $\frac{1}{2}$ in. thick. Keep the gables $\frac{1}{4}$ in. in from the left end and $\frac{1}{2}$ in. in from the front edge.

House and Loft

The small platform alongside the door is cut out and glued in position. The adjunct house and loft is built up with solid blocks. The house gable block (A) at Fig. 4 measures 2 ins. by $1\frac{1}{2}$ ins. by $1\frac{1}{2}$ in., with the roof block (B) $2\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. by $\frac{3}{4}$ in. The loft piece is $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. by $\frac{3}{4}$ in.

Glue the house block to the mill, then bevel the roof piece with a chisel and affix on top, the loft block following. A small attic piece may be added to the roof, but is not essential. Note particularly (from the end elevation at Fig. 3) that the gable block is kept in $\frac{1}{2}$ in. from the front of the mill.

Making the Sails

The fan "sails" are cut from $1/16$ in. thick

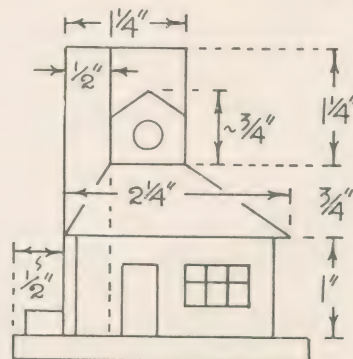


Fig. 3—House dimensions

plywood the size given at Fig. 2. Only one half is shown, so cut two together lengthwise from two pieces of wood. The pieces are then drilled in the centre to suit the thickness of the motor shafting and glued together to make an even cross.

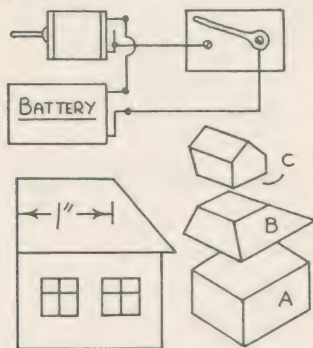


Fig. 4—Wiring circuit with details of house parts

pitch. Twist more than necessary owing to decrement upon drying. The nail is then withdrawn and the fan tested on the motor shafting via the battery.

To colour the work, paint the complete structure grey. When dry, colour the base and doors green.

It is better to have a suitable nail through the hub holes to ensure they meet properly. Hub washers ($\frac{3}{8}$ in. diam. by $\frac{1}{4}$ in. thick) and cut, drilled and inserted over the nail.

When dry, the "sails" are steamed over a kettle and twisted to the left-hand side at a reasonable

The windows should be blackened in, with the "frames" painted on with green; the sides and tops of the window spaces should be coloured similar.

The roofs are painted brick red or can be covered with slate roof paper or red tile paper as used in making doll's houses. The "vaness" of the sails are indicated in black as shown.

Connections

When the enamel has dried, connect lengths of S.W.G. double-covered wire to the motor terminals and battery arms as in the circuit diagram (Fig. 4). Two roundhead brass screws are driven in the house roof at the back, the switch being made from a paper clip. The bared ends of the wire are inserted beneath the screw heads which are first made loose, then tightened.

MATERIALS REQUIRED

- 1 piece deal 6ins. by 3ins. by $\frac{1}{2}$ in. thick.
- 1 piece deal 9ins. by 3ins. by $\frac{1}{2}$ in. thick.
- 1 piece plywood 4 $\frac{1}{2}$ ins. by 3ins. by $\frac{1}{2}$ in. thick.
- 1 piece plywood 6ins. by 6ins. by $\frac{1}{2}$ in. thick.
- 1 piece plywood 6ins. by 4ins. by $\frac{1}{16}$ in. thick.
- 1 piece deal 2ins. by 1 $\frac{1}{2}$ ins. by $\frac{1}{2}$ in. thick.
- 2 in. by 4 roundhead brass screws.

Electric Parts.—

- 1 electric motor.
- 1 2-cell battery.
- Some S.W.G. covered wire or ordinary twin flex.

"Snap" into this PHOTOGRAPHIC CROSSWORD!



PHOTOGRAPHERS have a chance to test their knowledge of their favourite pastime this week. The clues are simple, with straightforward answers and a few technical ones to give some "flavour" to the puzzle. We might mention again, at this point, however, that no prizes are offered for correct solutions. Does that make you lose interest immediately? Och, mon, d'ye no ken that yeer gettin' th' benefit o' th' pizzle in anither wa'? Come now, let's see you do it in the stipulated 30 minutes. You can start off with all the abbreviations and parts of syllables. That will fill in most of the spaces and make things a lot easier.

The correct square next week, together with another crossword on another popular subject the week after.

CLUES DOWN

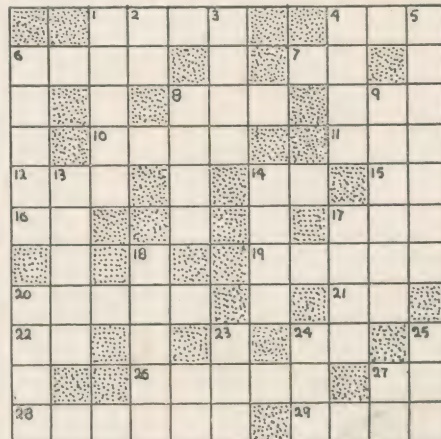
1. If this is poor for snapshots, one can try a time exposure.
2. Seen in the centre of "bell."
3. A popular brand of roll film.
4. The sixteenth part of an ounce in avoirdupois weight.
5. A kind of printing paper that is fast and ideal for enlargements.
6. The apertures in box cameras regulating the light.
8. The top or summit of anything.
9. A photographer would be lost without one.
13. Snaps are pasted in it.
14. One should be kept specially for the developer or hypo.
17. Every amateur photographer should have one for printing, etc.
18. A well-known make of camera.
20. It is supplied on special spools.
23. A period of existence.
24. If you own one, it should take a good photo.

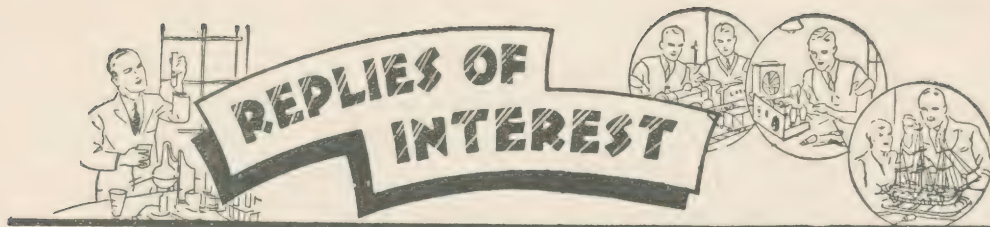
25. We write with it.
27. Same as 27 across.

CLUES ACROSS

1. The "eye" of a camera.
4. To be good at photography.
6. Dirty fingers will do this to a print.
7. A disjunctive particle introducing an alternative.
8. An intoxicating liquor made from malt by fermentation.
10. Used for fixing negatives or prints.
11. First half of "mammal."
12. Many young enthusiasts deserve one on the back.
14. Short for "doctor."
15. "Mit" curtailed.
16. Abbreviate "sergeant-at-law."
17. The safest colour of light in the darkroom.
19. It gives a splendid background to all your snaps.
20. Means bitter fury.
21. In the middle of "boar."
22. Cockney's way of saying "him."
24. Past Midnight (abbr.)

26. You must remember to hold the camera at the right one.
27. Not out.
28. To blur a print.
29. Wherein films or plates are developed if you have no darkroom.





Knife Throwing

COULD you please give me any information on knife throwing?—(R.H.)

MANY native African tribes use throwing knives, but they vary very greatly—some are wider in the blade than they are long, others like the Caucasian are about 9ins. long, 1½ins. wide in the blade, with a haft or handle about 5ins. long, 1 to 1½ins. wide and ¾in. or so in thickness. The Mexicans use a smaller knife and throw it from the palm with the thumb against the haft. They “eject” rather than throw. The main thing in all these knives appears to be the balance, which for good results would seem to be such that the centre of gravity comes about 40% of the length from the point end. In all cases the throw appears to be made by the motion of the arm as a whole, rather than from the wrist. The main object is to attain a high initial velocity, either by a high peripheral speed, as for instance, swing the arm from the shoulder or by a very sudden and powerful jerky motion, the knife being held as lightly as possible the whole time, and being largely propelled by tangential motion.

Tricks for White Mice

COULD you tell me some tricks which I can teach to white mice?—(P.G.)

YOUR problem depends upon your skill and patience. The easiest trick to teach your pet mice is by making a little wheel in their cage. An article on the construction of a simple cage like this appeared in *Hobbies Weekly*, dated December 16th, 1933, and a back copy can be obtained for 3d. post free. Cut two discs of plywood, whatever size you wish, but not less than 3ins. diameter, join these together by strong wire bars ¼in. apart or ½in. Bore a hole in one disc large enough for a mouse to enter, and fix the wheel with this hole over the exit hole of their box and so fixed that the wheel will revolve but the hole remain passable. The mice will enter and develop the habit of running over

the little wire bars to the wheel, which rotates like a tread-mill and thus gain much exercise. Other tricks are best tried by training the animals with a piece of food in your hand, or to reach food, but they are liable to jump and bite you or escape. By rubbing your hands with aniseed you can get them to keep very close to your hands as all animals like this substance, and after you have kept them a long time and fed them so regularly that they know you, you may risk training them to run free outside the cage without escaping, but do not try this until you have had them long enough to know you.

Home Talkies

I HAVE a camera and a projector and wish to make home talkies.—(E.C.)

THERE are, fundamentally, two ways of making home talkies—either you can use a disc as on a gramophone, in which case you have a microphone in circuit with the cutting needle in the tone-arm. Simultaneously with the speech—you film the subject in the usual way. When projecting the film you run the film and the record (via a gramophone) simultaneously. This is the cheapest and easiest way—it is by far the most practical for home purposes. The other way is the “sound on film” system, for which you must use special faking cine camera and have a photo electric cell, or kerr cell, amplifiers and other devices to record the speech in the form of a wavy line on the film. To project, you need the cine projector much as usual, plus another photo-electric cell, plus amplifier and loudspeaker equipment.

Hints on Hedgehogs

I HAVE caught a hedgehog and am at a loss to know of the best methods of housing and feeding it as a pet —(G.L.F.)

IT should be quite easy to tame and keep a pet hedgehog, but in the autumn, if it is kept in the garden it will probably hibernate or sleep for the winter in some warm retreat. It may wander

away to do this unless you give it a box with plenty of dead leaves in, straw, etc. into which it can burrow and keep warm. Hedgehogs feed on slugs, snails and insects and thus can be kept in kitchens where there are a lot of cockroaches at night. As pets in big wooden hutches with a mesh wire front, like rabbit hutches, they will take a lot of bread and milk which is often a good beginning for them. A little minced beef, potatoes, etc. may be tried occasionally, but the hedgehog may not care so much for this as its natural food. As a variation try shrimps occasionally, it may develop a fondness for them. If you wish to keep it awake in winter, it will need a warm place such as a kitchen or frost-proof shed. If it goes to sleep in a snug retreat do not worry, for it will come out again in spring. Probably you will find its body heavily invested with vermin; this does not stay long on humans, though troublesome at first when the hedgehog is picked up. On the whole, give your animal water or milk to drink, and vary its food from soft insects, grubs, slugs, bread and milk, cockroaches, etc., but during the winter it will not eat nearly so much as during summer.

Chemistry Queries

WHY does an acid turn blue litmus red, and an alkali turn it blue again. Does the fact that all acids contain hydrogen have anything to do with this? —(J.H.)

LITMUS is a blue dyestuff, its chief colouring matter being azolitmin, which is itself a red organic acid that forms blue salts. The explanation of the reverse phenomenon is somewhat technical. When an acid acts on blue litmus the hydrions (or hydrogen ions) from the acid are sufficiently concentrated to cause the formation of some unionised red litmus acid. The stronger the acid being tested the more complete is the operation, and consequently the more vivid is the red colour. Thus you are correct in thinking that the hydrogen factor is concerned in the colour changing process.

The correct way to make MODEL SHIP'S MASTS

THE masts are items of model period sailing ships which often receive scant, or no attention.

The hull may be painstakingly accurate, the spars and rigging in proportion, but the masts? Usually they consist of a plain round piece of dowelling with a slight taper at the top.

From the Elizabethan period right down to the advent of iron for spars, masts were extremely complicated. The fore and main masts were usually of seven or eight separate pieces, not to mention the fillings. We cannot, and need not, make our model masts as intricate as this, but we can give a very authentic appearance by some building and marking.

For an example, we will say that the model is of a warship of the period between the famous "Sovereign of the Seas," and Nelson's day.

The 'body' of the mast was the spindle, which extended from just below the partners to the head. In large ships the spindle was usually of two trees coaked together. The spindle was then flanked by two 'side-trees,' which extended from the heel, round the spindle, and finally tapered into the spindle just below the 'hounds.'

"Trees" and "Fishes"

These side-trees also consisted of two trees coaked together. Side-fishes were then added, fore and aft of the spindle and side-trees, and these made up the diameter of the mast.

Cant pieces were fixed between the side-trees and side-fishes to fill up, and the whole was rounded and tapered. All these parts were coaked and bolted together, after which iron hoops, about four inches broad, were driven on to the mast and spaced four feet apart.

The next step was the addition of the cheeks. These cheeks which were $\frac{3}{7}$ the length of the mast, ran from the head, swelled into the stop, and then tapered off into the side-trees. The cheeks were rounded and grooved on the inside to fit over the iron hoops, and then coaked and bolted on.

The Chocks

An oak chock was bolted on the fore side of the stop, and then a front-fish was added which extended from the chock nearly to the heel of the mast. This front fish was hollowed and grooved as the cheeks, to fix over the hoops, and the fore-side rounded to taper off into the mast.

The gaps between the edges of the front-fish and the mast were stopped with 'fillings' and the whole then bound together with wooldings.

Wooldings consisted of thirteen turns of rope

strained on between two narrow iron hoops. There was a woolding between each of the hoops previously knocked on.

Sometimes the fillings were as long as the fish, otherwise short pieces were used, just long enough to give a surface for each woolding.

Representing Hoops

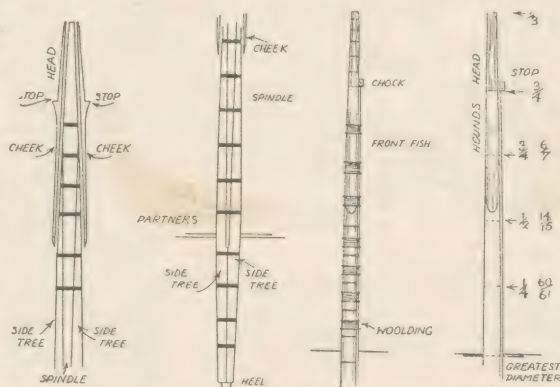
When modelling the mast, the spindle, side-trees and side-fishes can be made in one moulded piece. Hoops can be represented by brass, tin or paper wound to the required thickness, smoothed, and painted.

The cheeks and front-fish can be moulded and added (gluing is sufficient), and the wooldings wound on. If the model is a large one, fine black twine looks very realistic for the wound rope, with thin bands of brass or paper at each end.

The fillings should be short and tapered. These look better than long ones, and show up the front-fish and cheeks, giving a very real 'built' appearance.

The masts were usually treated as the hulls, being left timber coloured, and treated with tallow and turpentine. The tops were painted white.

The general ruling for the height of the masts varied but slightly. Around 1,700 masts were



two and one quarter times the width of the ship, but sixty years later it was slightly more complicated. The width of the ship was added to the length of the lower deck, and half this figure was the length of the main mast. The foremast was $\frac{1}{9}$ less, and the mizzen about $\frac{1}{7}$ less.

The mast was thickest at the partners, and then at the first quarter tapered $\frac{1}{61}$; at the second $\frac{1}{15}$; at the third $\frac{1}{7}$, and at the fourth at the stop $\frac{1}{4}$. The taper continued to the head, which was $\frac{1}{3}$ less than the diameter of the mast at the partners. From the partners to the heel the mast usually tapered off for $\frac{1}{7}$.

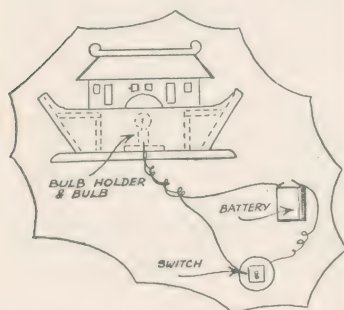
HINTS & TIPS

WORTH KNOWING

For original Tips published the sender will receive two dozen Fretsaw Blades. We cannot acknowledge all those received, or guarantee to print them. Send to The Editor, Hobbies Weekly, Dereham, Norfolk. Keep them short and add rough pencil sketches if necessary.

Bedside Lamp

MAKE the Noah's Ark Match Holder (as described in Hobbies, dated Jan. 29th, 1938), but leave out the overlay on sides and the emery cloth on roof. Fit



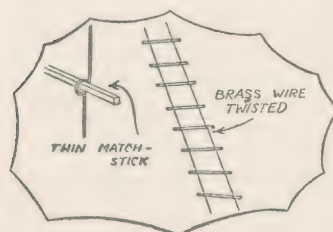
a sheet of coloured cellophane inside, covering windows and doors. Screw a bulb holder into base, fit bulb and connect to a flashlamp battery. When lit it makes an attractive little lamp.—(G.E.)

Book Edge Writing

THIS tip will be found very useful when it is necessary to write on the leaf edges of a book. When a pencil is used the point tends to sink into the leaves, but if a piece of carbon is used a much plainer character is produced.—(T.T.)

Ship's Ladders

HERE is a tip for making ladders for your model boat. First obtain some thin brass wire



and a number of half-match sticks. Thin these down and twist the wire around them as in diagram.—(D.D.)

Handy Weights.

IF you do not have a set of weights, you can weigh small amounts of a substance by this method. Put a certain weight in one pan of a balance, and in the other some air-rifle pellets to equal the balance. By counting the pellets you can then find a fraction of a weight.—(C. H.)

Clean Boring

WHEN boring a hole with a brace and bit, keep boring until the point of the bit shows through the opposite side of the wood, and then reverse the wood. Start boring where the point of the bit protruded, and you will find that the waste wood will come out without breaking the edge of the hole.—(P.B.)

Cycle Freewheel Hint

AS a useful hint when a cycle freewheel gets clogged and will not catch, a few drops of paraffin put inside the freewheel will often overcome the trouble and save expense.—(A.P.)

"Hints and Tips" Book

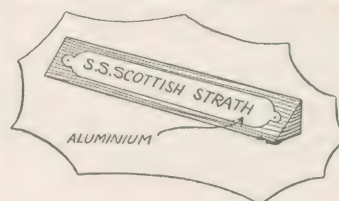
WHY not keep your hints and tips in a book? Have an ordinary exercise book into which on the right-hand side copy down the instructions and on the left-hand side the sketch if there is one from the Hints and Tips Page. Cover the backs with wall-paper and put a label on the front cover. On the front inside cover put an index and number the pages.—(J.S.)

Invisible Ink

HERE is the recipe for an invisible ink for which one generally has the constituents in the home. The ink is made by adding a little cornflour to water. Now comes the difference. Most other invisible inks are made to appear by heating, but for this one get a cup of hot water and put a drop or two of iodine in it. Hold the paper over the steam and a blue-purple writing will appear.—(A.H.P.)

Model Names

WHEN making a waterline ship model it is desirable to fit a name plate on the baseboard. An easy way to make one is to stamp the name with one of



those machines found on most railway stations where the name comes out nicely on a strip of aluminium, which already has two holes for fixing. Then pin the name-plate on to a piece of triangular fillet.—(A.B.)

Cycle Tip

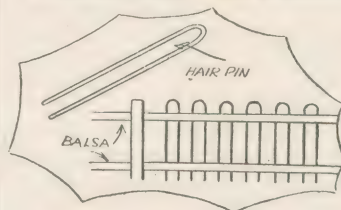
WHEN putting new handle grips on a cycle a good tip is to clean the handle bar ends with emery paper, then smear them with vaseline, and the grips slide on much more easily.—(W.C.)

Improved Morse Signaller

IN the design No. 2106 "Scout Morse Signaller," instead of the copper strip, a small bell push from the sixpenny stores looks much better.—(D.M.)

Railway Fencing

ACHEAP method of adding to the realistic appearance of your model railway is to use this miniature fence. This is made of



hairpins which can be purchased for a few pence in sizes to suit your model. The rails of the fence are thin strips of soft wood, through which the pins are inserted. After this, the strips may be glued to posts.—(C.R.)

The EDITOR'S NOTES



ONE of the countries which seems popular with our readers who want Pen Pals is Denmark, but unfortunately there are not too many readers in that country who are good correspondents. It is, after all, a wonderfully interesting part of Europe and England has many historical, political and trade links with it. I am glad therefore, to give readers the opportunity of making friends with a correspondent from Denmark, and am sure he will be pleased to give their address to other fellows there, so quite a little pen club can be formed. This reader is sixteen years old and his name and address are Knud Lauritzen, Aarosundvej 15, Haderslev, Denmark. Now then, you letter writers!

WITH the beginning of May and the approach of summer, there is bound to be increasing interest in photography, and I do hope those who have cameras will not wait until their holidays before they bring them out. We have already had an article on overhauling your camera if it has been laid away for the winter, and when those little attentions have been undertaken you will no doubt be able to go picture hunting every week-end. Much of the joy of photography must come to our readers in the operations of developing and printing for themselves, and although this can be done at the chemists it is much more exciting and certainly cheaper to do it yourselves.

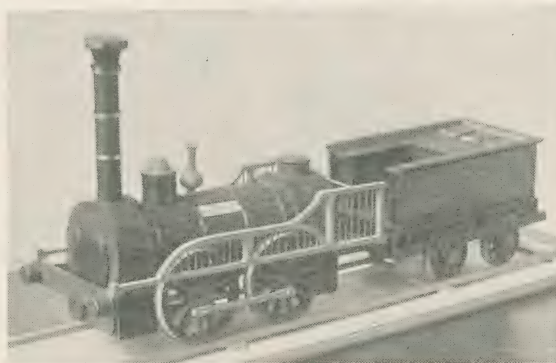
IN order too, to encourage amateur photographers to do their own developing and printing and thereby derive more pleasure and interest from their hobby, I have arranged for special free copies to be obtainable of a helpful 24 page booklet for which readers would be well advised to apply. In it are explained, step by step, the successive stages of picture-making with the camera. Following the simple instructions is no reason why a person who has never before even seen a film developed or a print made should not achieve success at his first attempt. The booklet "Modern Photographic Development" will be sent free to readers who

mention Hobbies Weekly and write to Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1.

IN connection with my note last week about the feminine workers it would be interesting to know what proportion of our readers are ladies. There are certainly more than there were, as is shown by the increasing entries in our competitions. Their interest, too, is slightly different as revealed by my mail bag and requests. The fellows are naturally interested in models of mechanical things, and designs which are practical and solid. The ladies, however, take more to the dainty little articles in fretwork, and particularly boxes and cabinets for their own needs.

I FIND, for instance that in the Royal Orphanage School for Girls at Wolverhampton, fretwork is quite a favourite hobby and many models and pieces of ordinary work have been completed. It is interesting to note that some work at making statuette figures of people of other lands, whilst others are forming almost a complete zoo with cut-out animals. Such a hive of industry is keenly fostered by the Headmistress and needless to say the girls thoroughly enjoy it. I only wonder if they enjoy the process of clearing up afterwards and putting everything away neatly as little as "George" does! His joy seems to be in getting everything all over the office as untidily as possible and then cheerily to trot off home and leave somebody else to clear up. Am afraid George will never reform!

"The COMET" LOCOMOTIVE Large Free Design next week



I WAS glad to hear recently of the success achieved by Master Stanley Jerny, of Market Lane, Blundeston, Lowestoft, who won a Hobbies Tool set with his excellent work at Evening Institute Classes. The village, you may be interested to know is the "Blundestone" which was immortalized by Dickens as the birthplace of 'David Copperfield' in the book of that name.

The Editor

MISCELLANEOUS ADVERTISEMENTS

The advertisements are inserted at the rate of 2d. per word prepaid. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Order and Stamps must accompany the order. They will be inserted in the earliest issue. To sell anything except fretwork goods or those shown in Hobbies Handbook. Orders can be sent either to Hobbies Weekly, Advertisement Dept. 30/32 Ludgate Hill, London, E.C.4, or Dereham, Norfolk.

STAMP Approvals: ½d. upwards, half catalogue price.—Vectis Stamp Supply, Binstead, I.O.W.

FREE! 40 British Colonial Stamps (including K.G. VI and pictorials), to approval applicants enclosing 2d. postage (abroad 6d.)—ACE Stamp Co., 118 St. Peter's Road, Reading.

BUILD A BOAT, Home Kits from 27/6, Completed from 49/6.—METACRAFT (H), Christchurch, Hants.

25 STAMPS FREE. Ask for approvals.—Oakes, Box 5403, Johannesburg, South Africa.

ARE YOU INTERESTED IN INSECTS? Join the Amateur Entomologists' Society. Annual subscription 4/-, including nine Bulletins. Specimen and particulars 3d. from—B. A. Cooper, 61 Okehampton Road, London, N.W.10.

READ the "Stamp Collectors Fortnightly." Editor Fred J. Melville, for lively articles and latest news, 5/- annually or 2d. fortnightly from your newsagent. Specimen from "S.C.F." 44 Bedford Row, W.C.1.

BRAND New Cabinet Maker's 4in. Precision Planing Machines, £4. Motorised, £7. Electric Motors; Paint Spray Plants; Drilling Machines, etc.—John H. Steel, Bingley.

WANTED original poems, songs, for immediate consideration. Send poems to Columbian Music Publishers, Ltd., Dept. 280, Toronto, Canada.

LONELY? Then write Secy., U.C.C., 16BB. Cambridge St., London, S.W.1. Genuine. Established 1905.

HOW TO STOP SMOKING.—Genuine remedy, proved by testimonials.—Write, The Stanley Institute, Ltd. (29W), 21 Warwick Lane, London, E.C.4.

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STAMP COLLECTORS' CORNER

INTEREST FOR ALL

HAS it ever occurred to you how fearfully dry our hobby may become unless we are careful? Not dry to ourselves, but to others, and it should therefore be the aim of every young philatelist to avoid this. Because one of the best things which we can do for the hobby is to get more and more people interested.

At first sight this may appear wrong, because you may think the more people there are collecting, the more difficult it will be to get specimens. Actually, this is not the case, except with the much more valuable stamps. The more there are collecting, the more stamps will be saved and the greater number in circulation.

Certainly the greater the number of collectors, the greater the demand and consequently the higher the prices for the valuable stamps and the greater the demand when we want to sell some of our own stamps.

Now let us consider some of the ways in which we can popularise the hobby. The obvious course is to show our collections to as many people as possible. This may have one of two effects, either of which will serve our purpose.

and say to himself: "Well of all the uninteresting hobbies, stamp collecting is the worst."

Probably you will see the case better if you think of some afternoon you have spent with a photographer friend who has taken nothing but photographs of his family and who insists that you look right through the album and see photograph of "X" at one year, photograph of "X" at two years and so on.

Compare that with an afternoon spent with someone who has taken a set of snaps which illustrate, say, a boat being built, or the process of mining china clay or slate.

Even if the second set of photographs are poor the interest is far above even works of art showing "X."

Now which is your collection? Just page after page of stamps all correctly mounted but about which there is nothing to say other than "That is a complete set of the 1900 issue from such and such a country."

Or do you, when you have a friend to look at your stamps, say to him: "Let me show you a copy of the first penny postage stamp issued," and then turn to a penny black of 1840 of Great Britain.

Then say: "Here is one of the smallest stamps ever issued" and show him the Victoria $\frac{1}{2}$ d. of 1873 or 1901.

Then again: "Here is a stamp printed in no less than four colours" and you turn to the stamps of Panama and point to the $\frac{1}{2}$ cent of the

1906 issue (carmine, blue, green and orange).

What one might call the ordinary straightforward collection may appeal to a friend who is already a collector, but it will not bring any recruits, while the interesting method will help—even if some of the specimens are slightly torn or heavily postmarked.

That almost reads as though the writer advises the retention of bad specimens torn or heavily

postmarked. Well, he does—but not of common varieties. Only of those which are of very definite interest and which one is not likely to get again easily.

Suppose the young collector takes a hint from the advanced specialist. When a large stamp exhibition is coming off the advanced collector does not dream of sending his whole collection for exhibition. One reason for this is that there would not be sufficient space, but he selects a few specimens which are of interest to other people and he sends these.

Very well, then, select out of your own collection say six or eight stamps or pages, learn all you can about these, paying particular attention to points which will appeal to a non-collector and be ready to show them, passing over the remainder unless anyone definitely asks to see them.

A certain draw is two stamps very nearly the same. Ask them to pick out the difference. Give them one or two easy ones. Then a puzzler.

In these pages we are always indicating such points of interest and it only needs you to pick out the particular stamp which appeals to you and of which you have a specimen. Memorise the history and point it out to others.

It should be possible for you to buy some of the specimens quoted. They are always chosen so they should be within the purse of any one of you. The Panama stamp mentioned costs fourpence and the 1901 Victoria halfpenny can be bought for three pence.

Then you might contrast this with one of the largest stamps—that of Russia—the 1921 Volga famine relief. It can be bought for sixpence unused, and was illustrated in the issue of *Hobbies Weekly* dated Nov. 20th.

Stamps printed on unusual paper are always quaint.

The two stamps shown from Latvia are both printed on the back of German military maps. The back of one of these is shown so you can see what they look like. They were issued in 1918 and now they only cost twopence each. The same country used bank notes on which to print stamps and these may be procured quite cheaply, too.



One of the smallest stamps

Printed on the back of military maps

First, it may induce the viewer to start collecting. If this is the case, then unload some of your common duplicates upon him. Not too many at a time, but give him a few and keep him interested.

The second effect may result in the person saying that he will not collect himself, but he will bear you in mind and see if he can get some for you.

But there is a third possibility. That is, he may see your stamps

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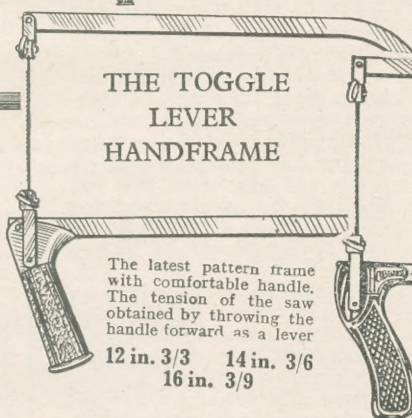


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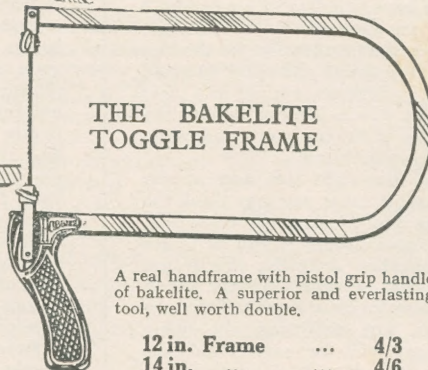
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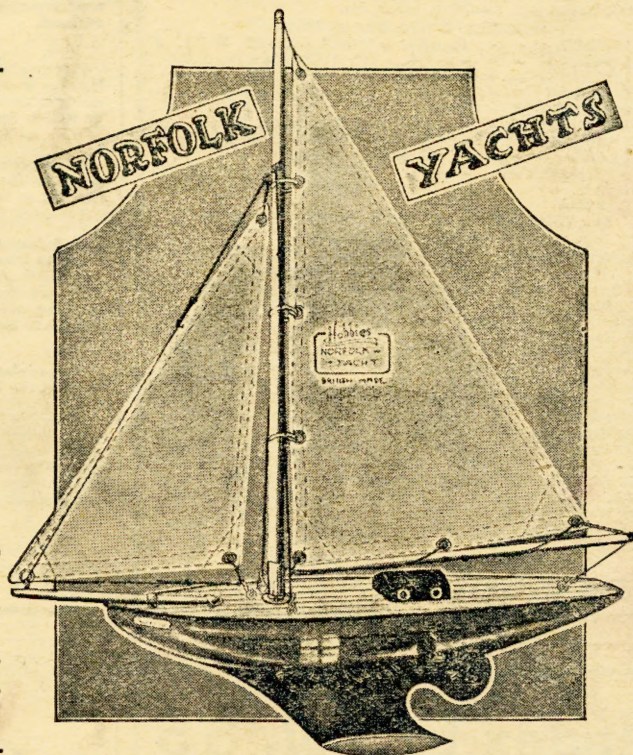
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